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COMPARISON OF INDIAN AND OVERSEAS STANDARDS ON ALUMINIUM ALLOY CASTINGS

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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April 1969

COMPARISON OF INDIAN AND OVERSEAS STANDARDS ON ALUMINIUM ALLOY CASTINGS

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CONTENTS

PAGE

0. FOREWORD 3

1. SCOPE 3

TABLE 1 COMPARISON OF IS DESIGNATION A-1 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 4

TABLE 2 COMPARISON OF IS DESIGNATION A-2 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 5

TABLE 3 COMPARISON OF IS DESIGNATION A-4 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 6

TABLE 4 COMPARISON OF IS DESIGNATION A-5 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 7

TABLE 5 COMPARISON OF IS DESIGNATION A-6 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 8

TABLE 6 COMPARISON OF IS DESIGNATION A-8 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 10

TABLE 7 COMPARISON OF IS DESIGNATION A-9 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 12

TABLE 8 COMPARISON OF IS DESIGNATION A-10 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 13

TABLE 9 COMPARISON OF IS DESIGNATION A-11 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 14

TABLE 10 COMPARISON OF IS DESIGNATION A-12 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 15

TABLE 11 COMPARISON OF IS DESIGNATION A-13 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 16

TABLE 12 COMPARISON OF IS DESIGNATION A-14 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 17

TABLE 13 COMPARISON OF IS DESIGNATION A-16 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 18

TABLE 14 COMPARISON OF IS DESIGNATION A-18 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 19

TABLE 15 COMPARISON OF IS DESIGNATION A-22 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 20

TABLE 16 COMPARISON OF IS DESIGNATION A-24 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS 21

APPENDIX A LIST OF OVERSEAS STANDARDS COVERED IN THE COMPARISON ... 22

APPENDIX B TEMPER DESIGNATIONS USED IN THE COMPARISON 24

COMPARISON OF INDIAN AND OVERSEAS STANDARDS ON ALUMINIUM ALLOY CASTINGS

0. FOREWORD

0.1 This comparison was adopted by the Indian Standards Institution on 15 December 1967, after the draft finalized by the Light Metals and Their Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This comparison has been prepared with a view to satisfying the general demand from the industry for a comprehensive publication which should include information about overseas standards for aluminium alloy castings equivalent to those covered in IS : 617-1959* and IS : 202-1966†. The comparison has been based mainly on the chemical composition of castings. It, however, includes mechanical properties. Information about typical end uses of aluminium alloy casting has also been included. Titles of the overseas standards including ISO Recommendation R 164-1960‡ and temper designations used in the comparison are given in Appendices A and B respectively.

0.3 It may be mentioned here that overseas standards included in this comparison are those which were available at the time of the preparation of this publication.

1. SCOPE

1.1 This publication compares aluminium alloy castings as specified in IS : 617-1959* with those specified in the American, Australian, Austrian, Belgian, British, Canadian, Czechoslovakian, Danish, French, German, Italian, Japanese, Korean, Netherlands, Polish, Russian, South African, Spanish, Swedish, Swiss, Yugoslavian and International standards. The comparison of sixteen alloys specified in IS : 617-1959* has been covered. No equivalent alloys could, however, be found in the overseas standards for IS designation A15 and A17 of IS : 617-1959*.

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*Aluminium and aluminium alloy ingots and castings for general engineering purposes (*revised*).

†Aluminium casting alloy ingots and castings for aircraft purposes (*second revision*).

‡Composition of aluminium alloy castings.

TABLE 1 COMPARISON OF IS DESIGNATION A-1 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	**Designation**	**Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)**													**Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)**				**Test Piece**	**Characteristics**	**Typical Applications**	**Type of Casting Suitability**
		Cu	**Mg**	**Si**	**Fe**	**Mn**	**Ni**	**Zn**	**Ti**	**Ti+ Nb**	**Pb**	**Sn**	**Also Specified**	**Al**	**Condition**	**Tensile Strength, kgf/mm²**	**Elongation, Percent**	**Brinell Hardness**				
IS : 617	A-1	6-8	0·15	2-4	1·0	0·6	0·5	2-4	—	—	0·3	0·2	—	REMAINDER	M	12·6 15·7	— —	— —	Sand Chill	Fair fluidity; a general purpose low cost alloy with moderate strength and good machinability	Crank cases, camshaft housings, chain covers, gear boxes, automotive timing gears, brake positions, cylinder head covers, household and industrial fittings and brackets, washing machine agitators, assembly jigs, patterns, electric switch-gears, etc	Mainly used as gravity die casting
ASTM B 26	CS74A	6·5-7·5	0·10	3·0-4·0	1·4	0·6	0·35	2·5	0·25	—	—	—	—		F	13·4	—	—	Sand			
ASTM B 108	CS74A	6·5-7·5	0·10	3·0-4·0	1·4	0·6	0·35	2·5	0·25	—	—	—	—		F	16·2	—	—	Chill			
QQ-A-596c	113	6·0-8·0	0·10	1·0-4·0	1·4	0·60	0·35	2·5	0·25	—	—	—	—		F	16·2	—	—	Semi-chill			
QQ-A-601c	113	6·0-8·0	0·10	1·0-4·0	1·4	0·6	0·35	2·5	0·25	—	—	—	—		F	13·4	—	—	Sand			
A.S. No. H.49	H49-1	6·0-8·0	0·15	2·0-4·0	1·0	0·6	0·5	2·0-4·0	—	—	0·3	0·2	—		F	12·6 15·7	— —	— —	Sand Chill			
B.S.1490	LM1	6-8	0·15	2-4	1·0	0·6	0·5	2-4	0·2	—	0·3	0·2	—		M	12·6 15·7	— —	— —	Sand Chill			
CSN 42 4356	Al-Cu8	6·0-8·0	0·3	1·5	1·0	0·6	0·3	2·5	—	—	0·2	0·3	—		Eq	12 13	0·5 0·5	60 70	Sand Chill			

TABLE 2 COMPARISON OF IS DESIGNATION A-2 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-2	0·7-2·5	0·30	9·0-11·5	1·0	0·5	1·0	1·2	0·2	—	0·3	0·2	—	REMAINDER	M	12·6 15·0	— —	— —	Sand Chill	Excellent fluidity and pressure tightness; suitable for intricate castings; machinability and hardness better than IS designation A-6 alloy	Motor housings, camera and meter cases; portable electric tools, window frames, etc	Mainly used as pressure die casting
A.S. No. H.49	H49-2	0·7-2·5	0·3	9·0-11·5	1·0	0·5	1·0	1·2	0·2	—	0·3	0·2	—		F	12·6 15·0	— —	— —	Sand Chill			
B.S. 1490	LM2	0·7-2·5	0·30	9·0-11·5	1·0	0·5	1·0	1·2	0·2	—	0·3	0·2	—		M	15·0	—	—	Chill			
TGL 6556	G-AlSi9 Cu1	0·5-2·5	0·2-0·7	8·0-11·0	1·2	0·2-0·5	0·3	1·2	0·15	—	—	—	(Pb+Sn =0·3)		Eq	20	1·0	80	Die			

TABLE 3 COMPARISON OF IS DESIGNATION A-4 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-4	2·0-4·0	0·15	4·0-6·0	0·8	0·3-0·7	0·3	0·5	0·2	—	0·1	0·05	—	REMAINDER	M	14·2 15·7	2 2	— —	Sand Chill	General purpose alloy with moderate strength; good fluidity; pressure tightness and machinability; weldable	Automotive cylinder-heads, crank cases, junction boxes, gear boxes, clutch cases, switch gear covers, instrument cases, tool handles, ornamental grills, etc	Suitable as sand castings and gravity and pressure die castings
IS : 202	A-4	2·0-4·0	0·15	4·0-6·0	0·80	0·30-0·70	0·30	0·50	0·20	—	0·10	0·05	—		M	14·2 15·7	2 2	— —	Sand Chill			
ASTM B 26	SC64D	3·0-4·0	0·10	5·5-6·5	1·0	0·50	0·35	1·0	0·25	—	—	—	—		F	16·2	1·5	—	Sand			
ASTM B 108	SC64D	3·0-4·0	0·10	5·5-6·5	1·0	0·50	0·35	1·0	0·25	—	—	—	—		F	19·0	2·5	—	Chill			
QQ-A-601c	A11 cast	3·3-4·3	0·10	5·5-7·0	1·0	0·5	0·35	1·0	0·25	—	—	—	—		F	16·2	1·5	—	Sand			
QQ-A-596c	319	3·3-4·3	0·10	5·5-7·0	1·0	0·50	0·30	1·0	0·25	—	—	—	—		F	20·4	2·5	—	Semi-chill			
A.S. No.H.49	H49-3	2·0-4·0	0·15	4·0-6·0	0·8	0·3-0·7	0·3	0·5	0·2	—	0·1	0·05	—		F	14·2 15·7	2 2	— —	Sand Chill			
B.S. 1490	LM4	2·0-4·0	0·15	4·0-6·0	0·8	0·3-0·7	0·3	0·5	0·2	—	0·1	0·05	—		M	14·2 15·7	2 2	— —	Sand Chill			
B.S. L79	—	2·0-4·0	0·15	4·0-6·0	0·8	0·3-0·7	0·3	0·5	0·2	—	0·1	0·05	(Fe+Mn=1·3)		Eq	14·2 15·7	2 2	— —	Sand Chill			
CSA HA.9	SC53	2·0-4·0	0·15	4·0-6·0	0·80	0·30-0·70	0·30	0·20	0·20	—	—	—	—		F	14·1	1	—	Sand			
CSA HA.10	SC53	2·0-4·0	0·15	4·0-6·0	1·0	0·30-0·70	0·30	0·20	0·20	—	—	—	—		F	17	2	—	Chill			
CSN 42 4381	Al-Si5-Cu2	2·0-3·0	0·1	4·5-6·0	1·1	0·3	—	0·3	—	—	—	—	—		Eq	15	1	45	Sand			
		2·0-3·0	0·1	4·5-6·0	1·4	0·3	—	0·3	—	—	—	—	—			15	1	45	Chill			
		2·0-3·0	0·5	5·0-7·0	1·5	0·5	—	1·2	—	—	—	—	—			15	—	60	Die			
DS 15 511	Al 511	2·0-4·0	0·15	4·0-6·0	1·0	0·5	—	0·5	—	—	0·1	0·05	—		Eq	12	3	50	Sand			
ISO/R 164	Al-Si5Cu3	2·0-4·5	0·15	4·0-6·5	1·0	0·2-0·7	0·3	0·5	0·2	—	0·1	0·05	—		Eq	—	—	—	—			
	Al-Si5Cu3 Fe	2·0-4·5	0·15	4·0-6·5	1·3	0·2-0·7	0·3	0·5	0·2	—	0·1	0·05	—		Eq	—	—	—	Die			
KSD 6006	AlDC6	2·0-4·5	0·3	4·5-7·5	1·3	0·3	0·5	1·0	—	—	—	0·3	—		Eq	24·5	3·0	—	Die			
PN-53/H-88027	AlSi5Cu2	1·5-3·5	0·2-0·8	4·0-6·0	1·0	0·2-1·0	—	0·3	—	—	—	—	—		Eq	12	—	65	Chill			
GOST 2685	AЛ3B	1·5-3·5	0·2-0·8	4·0-6·0	1·1	0·2-0·8	0·5	0·5	—	—	—	—	—		Eq	12	—	65	Sand			
		1·5-3·5	0·2-0·8	4·0-6·0	1·3	0·2-0·8	0·5	0·5	—	—	—	—	—			16	0·5	65	Chill			
SIS 14 4231	AlSi5Cu3	2·0-4·5	0·15	4·0-6·5	1·0	0·2-0·7	0·3	0·5	0·2	—	0·1	0·05	—		M	14 16	2 2	50 60	Sand Chill			
JUS C.C2.300	AlSi5Cu3	2·0-4·0	—	4·0-6·0	0·8	0·5	—	0·2	—	—	—	—	—		Eq	13 17	1·5 1	80 90	Sand Chill			

TABLE 4 COMPARISON OF IS DESIGNATION A-5 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-5	0·1	3·0-6·0	0·3	0·6	0·3-0·7	0·1	0·1	—	0·2	0·05	0·05	—	REMAINDER	M	14·2 17·3	3 5	— —	Sand Chill	Medium strength alloy; excellent resistance to corrosion and tarnish with good machinability; suitable for anodizing	Utensils, sewage and chemical equipment; ornamental hardware; furniture; fittings for cars, marine and pipes, etc	Mainly used as sand castings and gravity die castings
ASTM B 26	G4A	0·15*	3·5-4·5	0·35	0·50*	0·35*	—	0·15	0·25	—	—	—	—		F	15·5	6·0	—	Sand			
QQ-A-601c	214	0·15	3·5-4·5	0·35	0·50	0·35	—	0·15	0·25	—	—	—	—		F	15·5	6·0	—	Sand			
A.S. No. H.49	H49-4	0·1	3·0-6·0	0·3	0·6	0·3-0·7	0·1	0·1	—	0·2	0·05	0·05	—		F	14·2 17·3	3 3	— —	Sand Chill			
M 3429	GAlMg5	0·05	4·0-6·0	0-1·3	0·5	0·1-0·6	—	0·1	0-0·2	—	—	—	(Cr=0-0·3)		Eq	16 17	2 3	55 60	Sand Chill			
	GDAlMg5	0·2	4·0-7·0	0·4-0·8	1·2	0·3-0·6	—	0·4	—	—	—	—	—		Eq	19	1	60	Die			
B.S. 1490	LM5	0·1	3·0-6·0	0·3	0·6	0·3-0·7	0·1	0·1	0·2	—	0·05	0·05	—		M	14·2 17·3	3 5	— —	Sand Chill			
B.S.L74	—	0·1	3·0-6·0	0·3	0·6	0·3-0·7	0·1	0·1	—	0·2	0·05	0·05	—		Eq	14·2 17·3	3 5	— —	Sand Chill			
CSA HA. 9	G4	0·10	3·5-4·5	0·30	0·40	0·30	—	0·10	0·20	—	—	—	—		F	15·5	6	—	Sand			
CSN 42 4515	Al-Mg5	0·05	4·5-5·5	0·6-1·5	0·5	0·1-0·5	—	0·1	0·3	—	—	—	(Cr=0·3) (Sb=0·3)		Eq	12	1	55	Sand and chill			
TGL 6556	G-AlMg5	0·05	3·5-5·5	0·5-1·3	0·5	0·05-0·5	—	0·10	0·20	—	—	—	—		Eq	15 17	2 3	55 60	Sand Chill			
UNI 3058	G-AlMg5	0·08	4·5-5·5	0·5	0·5	0·2-0·5	0·02	0·2	0·2	—	—	—	—		Gs	16	3	55	Sand			
ISO/R 164	Al-Mg5Sil	0·10	4·0-6·0	0·5-1·5	0·5	0·5	0·05	0·2	0·2	—	0·05	0·05	—		Eq	—	—	—	—			
JIS H 5202	AC7A	0·1	3·5-5·5	0·3	0·4	0·8	—	0·1	0·2	—	—	—	—		F	22	12	60	Sand			
PN-53/H-88027	AlMg5Sil	0·1	4·5-5·5	0·8-1·3	0·5	0·1-0·4	—	0·2	—	—	—	—	—			15	1·0	55	Sand			
GOST 2685	АЛ13	0·1	4·5-5·5	0·8-1·3	0·5	0·1-0·4	—	0·2	—	—	—	—	(Zr=0·15)		Eq	15	1	55	Sand and chill			
		0·1	4·5-5·5	0·8-1·3	1·5	0·1-0·4	—	0·2	—	—	—	—	(Zr=0·15)			17	0·5	55	Die			
VSM 10854	GAl-5Mg	0·05	4-6	0·8-1·2	0·6	0·2-0·4	—	0·1	—	—	—	—	—		Eq	16 13	2 3	50 60	Sand Chill			

*For cooking utensils, copper 0·30 percent, *Max*; manganese 0·6 percent, *Max*; and iron 0·6 percent, *Max*; are permitted.

TABLE 5 COMPARISON OF IS DESIGNATION A-6 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-6	0·1	0·10	10·0-13·0	0·6	0·5	0·1	0·1	—	—	0·1	0·05	—	REMAINDER	M	16·5 18·9	5 7	— —	Sand Chill	Excellent fluidity and pressure tightness; good resistance to corrosion; suitable for intricate castings; weldable	Water-cooled manifolds and jackets; motor car and road transport fittings; motor housings; meter cases and switch boxes; typewriter frames for every large castings, for example, cast doors and panels where ease of casting is essential; for chemical & dye industry castings, for example, pump parts, for paint industry, food and domestic castings, etc	Suitable as sand castings and gravity and pressure die castings
IS : 202	A-6	0·10	0·10	10·0-13·0	0·60	0·50	0·10	0·10	—	—	0·10	0·05	—		M	16·5 18·9	5 7	— —	Sand Chill			
ASTM B 85	S12A	0·6	0·10	11·0-13·0	1·3	0·35	0·50	0·50	—	—	—	0·15	—		F	29·5	3·5	—	Die			
QQ-A-591a	A13	0·6	0·10	11·0-13·0	1·3	0·35	0·50	0·50	—	—	—	0·15	—		F	29·5	3·5	—	Die			
A.S. No. H.49	H49-5	0·1	0·1	10·0-13·0	0·6	0·5	0·1	0·1	—	—	0·1	0·05	—		F	16·5 18·9	5 7	— —	Sand Chill			
M 3429	GDAlSi13	0·4	0·5	11·0-13·5	1·2	0·3-0·5	—	0·4	0·15	—	—	—	—		Eq	18	1	60	Die			
B.S. 1490	LM6	0·1	0·10	10·0-13·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		M	16·5 18·9	5 7	— —	Sand Chill			
B.S. 4L33	—	0·1	0·10	10·0-13·0	0·6	0·5	0·1	0·1	—	—	0·1	0·05	—		Eq	16·5 18·9	5 7	— —	Sand Chill			
NBN 436	GAlSi12	0·1	0·1	9·7-13·3	0·7	0·6	0·2	0·2	0·25	—	0·05	0·05	—		Eq	17	4	50	Sand			
CSA HA 9	S12N	0·10	—	11·0-13·0	0·60	0·30	—	0·10	—	—	—	—	—		F	16·5	5	—	Sand			
CSN 42 4330	Al-Si13	0·1	0·1	10·0-13·0	0·6	0·3-0·5	—	0·1	0·15	—	—	—	—		Eq	15	2	45	Sand			
		0·1	0·1	10·0-13·0	0·6	0·3-0·5	—	0·1	0·15	—	—	—	—			16	2	50	Chill			
		0·2	0·5	10·0-13·0	1·5	0·3-0·5	—	0·3	0·15	—	—	—	—			13	—	55	Die			
DS 15 501	Al 501	0·4	0·10	11·0-13·5	0·6	0·5	—	0·3	—	—	—	—	—		Eq	13	1	45	Sand			
NF A57-702	A-S13-Y	0·10	0·10	11-13·5	0·70	0·3	0·05	0·15	0·15	—	0·10	0·05	(Co=0·2)		Y20 Y30	16·5 18	4·0 5·0	50 60	Sand Chill			
PN A57-703	A-S13-Y4	0·6	0·2	11-13·5	1·3	0·3	0·5	0·5	0·2	—	—	0·1	(Fe+Zn+Ni+Sn+Mg=2·5)		Eq	17 18	2 1·5	— —	Chill Die			
DIN 1725	G-AlSi12	0·05	0·05	11·0-13·5	0·6	0-0·5	—	0·10	0·15	—	—	—	—		Eq	17 20	4 3	50 55	Sand Chill			
UNI 4514	G-AlSi13	0·10	0·10	12-13·5	0·7	0·4	0·10	0·10	0·15	—	—	—	—		Gs Gc	17 18	4 5	50 55	Sand Chill			
ISO/R 164	AlSi12	0·10	0·10	11·0-13·5	0·70	0·5	0·1	0·1	0·15	—	0·1	0·05	—		Eq	—	—	—	—			
	AlSi12Fe	0·10	0·10	11·0-13·5	1·3	0·5	0·1	0·1	0·15	—	0·1	0·05	—		Eq	—	—	—	—			

(*Continued*)

TABLE 5 COMPARISON OF IS DESIGNATION A-6 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS — *Contd*

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
JIS H 5202	AC3A	0·2	0·1	10·0-13·0	0·8	0·3	—	0·3	—	—	—	—	—	REMAINDER	F	18	5	50	Sand and chill	Excellent fluidity and pressure tightness; good resistance to corrosion; suitable for intricate castings; weldable	Water-cooled manifolds and jackets; motor car and road transport fittings; motor housings; meter cases and switch boxes; typewriter frames for every large castings, for example, cast doors and panels where ease of casting is essential; for chemical & dye industry castings, for example, pump parts, for paint industry, food and domestic castings, etc	Suitable as sand castings and gravity and pressure die castings
KS D6006	AlDC1	0·6	0·1	11·0-13·0	1·3	0·3	0·5	0·5	—	—	—	0·1	—		Eq	24·5	3·5	—	Die			
NEN 6026	GAlSi12	0·1	0·1	11·0-13·5	0·6	0·5	0·05	0·1	0·15	—	0·1	0·05	—		Eq	17 20	4 3	60 60	Sand Chill			
PN-53 H-88027	AlSi11	0·8	—	10·0-13·0	0·8	0·5	—	0·3	—	—	—	—	—		Eq	—	—	—	Sand			
		0·8	—	10·0-13·0	1·2	0·5	—	0·3	—	—	—	—	—			15	4·0	50	Chill			
		0·8	—	10·0-13·0	1·5	0·5	—	0·3	—	—	—	—	—			16	2·0	50	Die			
GOST 2685	АЛ2	0·6	0·1	10·0-13·0	0·8	0·5	—	0·3	—	—	—	—	—		Eq	15	4	50	Sand			
		0·6	0·1	10·0-13·0	1·0	0·5	—	0·3	—	—	—	—	—			16	2	50	Chill			
		0·6	0·1	10·0-13·0	1·5	0·5	—	0·3	—	—	—	—	—			16	1	50	Die			
UNE 38252	Al-Si-12	0·1	0·1	11-13	0·6	—	—	0·1	0·1	—	—	—	—		Eq	17 18	4 5	50 60	Sand Chill			
VSM 10855	GAl-12Si	0·05	—	11-13·5	0·6	0·1-0·5	—	0·1	—	—	—	—	—		Eq	17 20	4 3	45 55	Sand Chill			
SIS 14 4260	Al Si12	1·2	0·3	11·0-13·5	0·8	0·5	0·2	0·5	0·2	—	0·1	0·1	—		Eq	14 15	1 2	50 55	Sand Chill			
SIS 14 4261	Al Si12	0·20	0·1	11·0-13·5	0·70	0·5	0·1	0·3	0·20	—	0·1	0·05	—		Eq	17 18	4 5	50 55	Sand Chill			
JUS C.C2.300	Al Si12	0·1	0·05	11·0-13·5	0·6	0·3-0·5	—	0·1	0·15	—	—	—	—		Eq	14	3	60	Sand			
		0·1	0·05	11·0-13·5	0·6	0·3-0·5	—	0·1	0·15	—	—	—	—			15	4	70	Chill			
		0·4	0-0·5	11·0-13·0	1·5	0·2-0·7	—	0·4	—	—	—	—	—			18	1	60	Die			
S.A.B.S. 372	—	0·1	0·10	10·0-13·0	0·6	0·5	0·1	0·1	—	—	0·1	0·05	—		AC	16·5 18·9	5 7	— —	Sand Chill			
		0·6	0·1	11·0-13·0	0·8	0·3	0·5	0·3	—	—	—	0·1	—		AC	16·5 18·9	5 7	— —	Sand Chill			

TABLE 6 COMPARISON OF IS DESIGNATION A-8 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—	REMAINDER	M	12·6 16·5	2 3	— —	Sand Chill	Good fluidity, pressure tightness and resistance to corrosion, suitable for intricate castings; weldable	Aircraft pump parts, fittings and control parts; automotive transmission cases; water-cooled cylinder blocks; marine hardware; outboard motor parts; valve bodies and fittings; railway tank car fittings; truck-axle housings and wheels; large fan blades; pneumatic tools, etc; suitable for application in chemical and food industries	Mainly used as sand castings and gravity die castings
A.S. No. H.49	H49-6	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		F	12·6 16·5	2 3	— —	Sand Chill			
B.S. 1490	LM8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		M	12·6 16·5	2 3	— —	Sand Chill			
D.T.D. 716A	—	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		M	12·6 16·5	2 3	— —	Sand Chill			
NF A 57-702	A-S4G-Y	0·10	0·40-0·95	3·5-4·8	0·65	0·25-0·65	0·05	0·10	0·3	—	0·10	0·05	(Co=0·2)		Y20 Y30	14 17	1·0 1·5	50 60	Sand Chill			
PN A57-703	A-S4G-Y4	0·3	0·4-0·9	4·0-7·0	1·3	1·0	0·5	0·5	0·2	—	—	0·1	(Fe+Zn+Ni+Sn=2·0)		Eq	16 17	1 1	— —	Chill Die			
DIN 1725	G-Al Si5Mg	0·05	0·5-0·8	4·5-6·0	0·5	0-0·5	—	0·10	0-0·20	—	—	—	—		Untreated	14	1	55	Sand			
TGL 6556	G-Al Si5Mg	0·05	0·35-0·6	4·5-6·0	0·5	0·15-0·5	—	0·10	0·15	—	—	—	—		Untreated	14	1	60	Chill			
UNI 3054	G-AlSi4·5 MnMg	0·1	0·55-0·75	4·2-5·2	0·6	0·6-0·8	0·05	0·1	0·15	—	—	—	—		Gc	14	2·5	55	Chill			
ISO/R 164	AlSi5Mg	0·1	0·4-0·9	3·5-6·0	0·6	0·6	0·1	0·1	0·2	—	0·1	0·05	—		Eq	—	—	—	—			
NEN 6026	G-AlSi5 Mg	0·1	0·4-0·8	4·5-6·0	0·5	0·6	0·05	0·1	0·2	—	0·05	0·05	—		Eq	14	1	60	Sand			
IS : 617	A-8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		W	16·5 23·6	2·5 5	— —	Sand Chill			
A.S. No. H.49	H49-6	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		T4	16·5 23·6	2·5 5	— —	Sand Chill			
B.S. 1490	LM8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		W	16·5 23·6	2·5 5	— —	Sand Chill			
D.T.D. 727A	—	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		W	16·5 23·6	2·5 5	— —	Sand Chill			
S.A.B.S. 376	—	0·1	0·2-0·6	4·5-6·0	0·6	0·3-0·7	0·1	0·1	—	—	0·1	0·05	—		SHT	17·1 23·4	2·5 5·0	— —	Sand Chill			
IS : 617	A-8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		P	15·0 18·9	1 2	— —	Sand Chill			
A.S. No. H.49	H49-6	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		T5	15·0 18·9	1 2	— —	Sand Chill			
B.S.1490	LM8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		P	15·0 18·9	1 2	— —	Sand Chill			
D.T.D. 722A	—	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		P	15·0 18·9	1 2	— —	Sand Chill			

(*Continued*)

TABLE 6 COMPARISON OF IS DESIGNATION A-8 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS — *Contd*

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	**Mg**	**Si**	**Fe**	**Mn**	**Ni**	**Zn**	**Ti**	**Ti+Nb**	**Pb**	**Sr.**	**Also Specified**	**Al**	**Condition**	**Tensile Strength, kgf/mm²**	**Elongation, Percent**	**Brinell Hardness**				
NF A57-702	A-S4G-Y	0·10	0·40-0·95	3·5-4·8	0·65	0·25-0·65	0·05	0·10	0·3	—	0·10	0·05	(Co=0·2)	REMAINDER	Y23 Y33	23 25	1·0 1·5	85 85	Sand Chill	Good fluidity pressure tightness and resistance to corrosion, suitable for intricate castings; weldable	Aircraft pump parts, fittings and control parts; automotive transmission cases; water-cooled cylinder blocks; marine hardware; outboard motor parts; valve bodies and fittings; railway tank car fittings; truck-axle housings and wheels; large fan blades; pneumatic tools, etc; suitable for application in chemical and food industries	Mainly used as sand castings and gravity die castings
DIN 1725	G-Al Si5Mg	0·05	0·5-0·8	4·5-6·0	0·5	0-0·5	—	0·10	0-0·20	—	—	—	—		ka	18	2	70	Sand			
TGL 6556	G-AlSi5 Mg	0·05	0·35-0·6	4·5-6·0	0·5	0·15-0·5	—	0·10	0·15	—	—	—	—		Eq	17	1	70	Chill			
IS : 617	A-8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		WP	23·6 28·3	— 2	— —	Sand Chill			
A.S. No. H.49	H49-6	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		T6	23·6 28·3	— 2	— —	Sand Chill			
M 3429	GAlSi5Mg	0·05	0·5-0·8	4·0-6·0	0·5	0·2-0·6	—	0·1	0-0·2	—	—	—	—		Eq	15 17	1 1·5	60 60	Sand Chill			
B.S. 1490	LM8	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		WP	23·6 28·3	— 2	— —	Sand Chill			
D.T.D. 735A	—	0·1	0·3-0·8	3·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		Eq	23·6 28·3	— 2	— —	Sand Chill			
NBN 436	G-AlSi5 Mg	0·1	0·4-0·8	3·5-5·9	0·7	0·3-0·9	0·1	0·1	0·25	—	0·05	0·05	—		Eq	22	0·5	90	Sand			
DIN 1725	G-Al Si5Mg	0·05	0·5-0·8	4·5-6·0	0·5	0-0·5	—	0·10	0-0·20	—	—	—	—		wa	24	0·5	80	Sand			
TGL 6556	G-AlSi5 Mg	0·05	0·35-0·6	4·5-6·0	0·5	0·15-0·5	—	0·10	0·15	—	—	—	—		Eq	19	0·5	85	Chill			
UNI 3054	G-AlSi4·5 MnMg	0·1	0·55-0·75	4·2-5·2	0·6	0·6-0·8	0·05	1	0·15	—	—	—	(Fe+Ti =0·2)		GsTA GcTA	20 25	1·0 1·0	80 90	Sand Chill			
NEN 6026	GAlSi5 Mg	0·1	0·4-0·8	4·5-6·0	0·5	0·6	0·05	0·1	0·2	—	0·05	0·05	—		Eq	24	—	90	Sand			
VSM 10856	GAl5Si Mg	0·05	0·4-1	3-6	0·6	0·3-1	—	0·1	—	—	—	—	—		Eq	24 26	0·5 1	90 90	Sand Chill			
S.A.B.S. 377	—	0·1	0·2-0·6	4·5-6·0	0·6	0·3-0·7	0·1	0·1	—	—	0·1	0·05	—		FHT	23·2 26·7	— 2·5	— —	Sand Chill			

TABLE 7 COMPARISON OF IS DESIGNATION A-9 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-9	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	—	0·2	0·1	0·05	—	REMAINDER	P	17·3 23·6	1·5 2	— —	Sand Chill	Used where fluidity and corrosion resistance of IS designation A-6 alloy together with high strength and hardness required	Engine & crank case for motor car, ship, aircraft, etc	Mainly used as sand castings and gravity die castings
A.S. No. H.49	H49-7	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	—	0·2	0·1	0·05	—		T5	17·3 23·6	1·5 2	— —	Sand Chill			
B.S. 1490	LM9	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	0·2	—	0·1	0·05	—		P	17·3 23·6	1·5 2	— —	Sand Chill			
IS : 617	A-9	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	—	0·2	0·1	0·05	—		WP	24·4 29·9	— —	— —	Sand Chill			
IS : 202	A-9	0·10	0·20-0·60	10·0-13·0	0·60	0·30-0·70	0·10	0·10	—	0·20	0·10	0·05	—		WP	24·4 29·9	— —	— —	Sand Chill			
A.S. No. H.49	H49-7	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	—	0·2	0·1	0·05	—		T6	24·4 29·9	— —	— —	Sand Chill			
M 3429	GAlSiMg	0·05	0·2-0·5	11·0-13·0	0·6	0·3-0·5	—	0·1	0·15	—	—	—	(Fe+Ti =0·65)		Eq	22 24	1 1	80 85	Sand Chill			
B.S. 1490	LM9	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	0·2	—	0·1	0·05	—		WP	24·4 29·9	— —	— —	Sand Chill			
B.S. L75	—	0·1	0·2-0·6	10·0-13·0	0·6	0·3-0·7	0·1	0·1	0·2	—	0·1	0·05	—		Eq	24·4 29·9	— —	— —	Sand Chill			
UNI 3049	G-AlSi12 MuMg	0·1	0·27-0·4	11·5-13	0·8	0·35-0·65	0·1	0·1	0·1	—	—	—	—		GsTA GcTA	22 24	1·0 1·0	80 80	Sand Chill			

TABLE 8 COMPARISON OF IS DESIGNATION A-10 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm^2	Elongation, Percent	Brinell Hardness				
IS : 617	A-10	0·1	9·5-11·0	0·25	0·35	0·10	0·10	0·10	—	0·2	0·05	0·05	—	REMAINDER	W	28·3 31·5	8 12	— —	Sand Chill	Combines best mechanical properties with good impact-strength, machinability and corrosion resistance; susceptible to stress - corrosion cracking; suffers loss of ductility at elevated temperatures; needs special foundry techniques	Highly stressed aircraft castings, marine fittings, mining equipment, railroad and passenger-car frames	Mainly used as sand castings and gravity die castings
IS : 202	A-10	0·10	9·5-11·0	0·25	0·35	0·10	0·10	0·10	—	0·20	0·05	0·05	—		W	28·3 31·5	8 12	— —	Sand Chill			
ASTM B 26	G10A	0·25	9·5-10·6	0·25	0·30	0·15	—	0·15	0·25	—	—	—	—		T4	29·5	12·0	—	Sand			
QQ-A-601c	220	0·25	9·5-10·6	0·25	0·30	0·15	—	0·15	0·25	—	—	—	—		T4	29·5	12·0	—	Sand			
A.S. No. H.49	H49-8	0·1	9·5-11·0	0·25	0·35	0·1	0·1	0·1	—	0·2	0·05	0·05	—		T4	28·3 31·5	8 12	— —	Sand Chill			
B.S.1490	LM10	0·1	9·5-11·0	0·25	0·35	0·10	0·10	0·10	0·2	—	0·05	0·05	—		W	28·3 31·5	8 12	— —	Sand Chill			
B.S. 2L53	—	0·1	9·5-11·0	0·25	0·35	0·10	0·10	0·10	0·25	—	0·05	0·05	—		Eq	28·3 31·5	8 12	— —	Sand Chill			
CSA HA.9	G10	0·10	9·5-10·6	0·20	0·30	0·10	—	0·10	0·10	—	—	—	—		T4	29·5	12	—	Sand			
CSN 424518	Al-Mg11	0·3	9·5-11·5	0·3	0·3	0·1	—	0·1	0·07	—	—	—	(Be=0·07)		Eq	28	9	60	Sand			
PN A57-703	A-G10-Y4	0·2	8·5-11	0·5	1·3	0·6	0·1	0·4	0·2	—	—	0·1	(Fe+Si+Cu+Zn+Ni+Sn=2·0)		Eq	23	2	—	Die			
DIN 1725	G-AlMg10	0·05	9·0-11·0	0·30	0·3	0-0·30	—	0·10	0-0·15	—	0·05	0·05	—		ho	25	8	80	Sand			
ISO/R 164	Al-Mg10	0·10	9·0-11·0	0·30	0·3	0·3	0·10	0·10	0·15	—	0·05	0·05	—		Eq	—	—	—	—			
JIS H 5202	AC7B	0·1	9·5-11·0	0·3	0·4	0·1	—	0·1	0·2	—	—	—	—		T4	30	10	75	Sand and chill			
NEN 6026	GAlMg10	0·1	9·0-10·5	0·3	0·3	0·3	0·1	0·1	0·15	—	0·05	0·05	—		Eq	28	8	90	Sand			
PN-53	AlMg10	0·1	9·5-11·6	0·3	0·3	0·1	—	0·1	—	—	—	—	—		Eq	28	9·0	60	Chill			
H-88027		0·1	9·5-11·6	0·3	—	0·1	—	0·1	—	—	—	—	—			20	1·0	90	Die			
GOST 2685	АЛ8	0·3	9·5-11·5	0·3	0·3	0·1	—	0·1	0·07	—	—	—	(Be=0·07) (Zr=0·2)		T4	29	9	60	Sand and chill			
S.A.B.S. 371	—	0·1	9·5-11·0	0·35	0·35	—	—	—	0·2	—	—	—	—		SHT	25·2 28·1 25·2	7 12 7	— — —	Sand Chill Sand			
		0·2	9·5-10·6	0·2	0·2	0·1	—	0·1	0·2	—	—	—	—		SHT	28·1	12	—	Chill			
NBN 436	GAlMg11	0·10	9·5-12·5	0·3	0·4	0·2	0·05	0·1	0·25	—	0·05	0·05	(Zr=0·25) (Be=0·05) (Cr=0·2) (Ti+Zr=0·25)		Eq	28	7	75	Sand			

TABLE 9 COMPARISON OF IS DESIGNATION A-11 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-11	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	—	0·05-0·30	0·05	0·05	—	REMAINDER	W	22·0 26·8	7 13	— —	Sand Chill	Combines high strength, ductility and machining characteristics; suitable for stressed castings and for components with shock-resistance	Aircraft wheel fittings and crank cases, bus wheels and rear-axle housings; drier shafts, fly-wheel housing; peripheral fitting parts, power transmission cable accessories; wrenches; typewriter key levers, etc	Mainly used as sand castings and gravity die castings
ASTM B 26	C4A	4·0-5·0	0·03	1·5	1·0	0·35	—	0·35	0·25	—	—	—	—		T4	20·4	6·0	—	Sand			
QQ-A-601c	195	4·0-5·0	0·03	1·5	1·0	0·35	—	0·35	0·25	—	—	—	—		T4	20·4	6·0	—	Sand			
A.S. No. H.49	H49-9	4·0-5·0	0·1	0·25	0·25	0·1	0·1	0·1	—	0·05-0·3	0·05	0·05	—		T4	22·1 26·8	7 13	— —	Sand Chill			
B.S. 1490	LM11	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	0·30	—	0·[illegible]	0·05	—		W	22·0 26·8	7 13	— —	Sand Chill			
D.T.D. 298B	—	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	0·05-0·30	—	0·05	0·05	—			22·0 26·8	7 13	— —	Sand Chill			
UNI 3044	G-AlCu4·5	4-5	0·06	1·2	1·0	0·1	0·05	0·2	0·2	—	—	—	—		GsTN	20	6	55	Sand			
PN-53 H-88027	AlCu4	4·0-5·0	0·03	1·2	1·0	—	—	0·3	—	—	—	—	—		Eq	20	6	60	Chill			
GOST 2685	AЛ7	4·0-5·0	0·03	1·2	1·0	0·1	—	0·2	0·2	—	0·01	0·01	—		T4	20 21	6 6	60 60	Sand Chill			
IS : 617	A-11	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	—	0·05-0·30	0·05	0·05	—		WP	28·3 31·5	4 9	— —	Sand Chill			
IS : 202	A-11	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	—	0·05-0·30	0·05	0·05	—		WP	28·3 31·5	4 9	— —	Sand Chill			
A.S. No. H.49	H49-9	4·0-5·0	0·1	0·25	0·25	0·1	0·1	0·1	—	0·05-0·3	0·05	0·05	—		T6	28·3 31·5	4 9	— —	Sand Chill			
B.S.1490	LM11	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	0·30	—	0·05	0·05	—		WP	28·3 31·5	4 9	— —	Sand Chill			
D.T.D. 304B	—	4·0-5·0	0·10	0·25	0·25	0·10	0·10	0·10	—	0·05-0·30	0·05	0·05	—		WP	28·3 31·5	4 9	— —	Sand Chill			
NF A57-702	A-U5GT-Y	4·2-5·0	0·15-0·35	0·30	0·35	0·10	0·05	0·10	0·3	—	0·05	0·05	—		Y24 Y34	30 33	5·0 7·0	90 90	Sand Chill			
DIN 1725	G-AlCu4Ti	4·0-5·0	0·03	0·3	0·4	0·1	0·05	0·10	0·1-0·3	—	—	—	—		wa	29 33	3 4	90 95	Sand Chill			
UNI 3044	G-AlCu4·5	4-5	0·06	1·2	1·0	0·1	0·05	0·2	0·2	—	—	—	—		GsTA	25	2	75	Sand			
JIS H 5202	AC1A	4·0-5·0	0·1	1·2	1·0	0·3	—	0·3	0·2	—	—	—	—		T6	28	3	80	Sand			

TABLE 10 COMPARISON OF IS DESIGNATION A-12 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	**Designation**	**Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)**													**Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)**				**Test Piece**	**Characteristics**	**Typical Applications**	**Type of Casting Suitability**
		Cu	**Mg**	**Si**	**Fe**	**Mn**	**Ni**	**Zn**	**Ti**	**Ti+ Nb**	**Pb**	**Sn**	**Also Specified**	**Al**	**Condition**	**Tensile Strength, kgf/mm²**	**Elongation, Percent**	**Brinell Hardness**				
IS : 617	A-12	9·0-10·5	0·15-0·35	2·0	0·5-1·5	0·6	0·5	0·1	—	—	0·1	0·1	—	REMAINDER	WP		—	100	—	Has good strength and hardness at elevated temperature with resistance to wear and machinability	Air-cooled cylinder heads; automotive pistons, bushings, bearing caps; electric iron sole plates castings for hydraulic brake systems, etc	Mainly used as sand castings and gravity die castings for pistons
ASTM B 26	CG100A	9·2-10·8	0·15-0·35	2·0	1·5	0·50	0·50	0·8	0·25	—	—	—	—		T61	21·1	—	—	Sand			
ASTM B 108	CG100A	9·2-10·8	0·15-0·35	2·0	1·5	0·50	0·50	0·8	0·25	—	—	—	—		T65	28·1	—	—	Chill			
A.S. No. H.49	H49-10	9·0-10·5	0·15-0·35	2·0	*0·5-1·5	0·6*	0·5	0·1	—	—	0·1	0·1	—		T6	—	—	100	Sand and chill			
B.S.1490	LM12	9·0-11·0	0·2-0·4	2·5	1·0	0·6	0·5	0·8	0·2	—	0·1	0·1	—		WP	28·3	—	—	Chill			
UNI 3041	AlCu10 FeMg	9·3-10·7	0·2-0·4	1·0	0·5-1·3	0·2	0·2	0·2	0·2	—	—	—	—		GsTA GcTA	21 28	0·5 0·5	110 125	Sand Chill			
S.A.B.S. 374	—	9·0-10·5	0·15-0·35	2·0	*0·5-1·5	0·6*	0·5	0·1	—	—	0·1	0·1	—		FHT	21·1 28·1	— —	— —	Sand Chill			
		9·2-10·8	0·20-0·35	2·0	1·2	0·5	0·3	0·4	0·2	—	—	—	—		FHT	21·1 28·1	— —	— —	Sand Chill			

*The total value of these elements shall not exceed 1·5 percent.

TABLE 11 COMPARISON OF IS DESIGNATION A-13 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-13	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	2·0-3·0	0·1	—	0·2	0·1	0·1	—	REMAINDER	WP	17·3 25·2	— —	100 100	Sand Chill	Good fluidity; high temperature strength and low coefficient of thermal expansion; good resistance to wear	Heavy duty automotive and diesel piston, pulleys, sheaves, etc	Mainly used as sand castings and gravity die castings for pistons
ASTM B 108	SN122A	0·50-1·5	0·7-1·3	11·0-12·5	1·3	0·35	2·0-3·0	0·35	0·25	—	—	—	—		T65	28·1	—	—	Chill			
A.S. No. H.49	H49-11	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	2·0-3·0	0·1	—	0·2	0·1	0·1	—		T6	17·3 25·2	— —	100 100	Sand Chill			
B.S. 1490	LM13	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	0·7-2·5	0·1	0·2	—	0·1	0·1	—		WP	17·3 28·3	— —	100 100	Sand Chill			
CSN 42 4336	Al-Si-Cu-Ni	0·8-1·3	0·8-1·3	11·5-13·0	—	0·3-0·5	1·0-2·0	0·1	0·1	—	—	—	(Fe+Ti =0·8)		Eq	14 13	0·3 —	85 80	Sand Chill			
JIS H 5202	AC8A	0·8-1·3	0·7-1·3	11·0-13·0	0·8	0·1	1·0-2·5	0·1	0·2	—	—	—	—		T6	28	—	110	Chill			
PN-53 H-88027	AlSi12Cu1 Ni1Mg	0·5-1·5	0·8-1·5	12·0-13·5	0·8	0·2	0·5-1·5	0·1	—	—	—	—	—		Eq	20	0·5	100	Chill			
JUS C.C2.300	AlSi12 Ni2CuMg	0·5-1·5	0·7-1·3	11·0-13·0	0·6	0·1	2·0-3·0	0·1	—	—	—	—	—		Eq	18	0·3	80	Chill			
UNE 38 254	Al-Si-Mg12	0·1	0·2-0·4	11-13	0·6	0·3-0·6	—	0·1	—	—	—	—	—		Eq	22 25	1 1	80 85	Sand Chill			
S.A.B.S. 380	—	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	2·0-3·0	0·1	—	—	0·1	0·1	—		FHT	17·1 25·3	— —	— —	Sand Chill			
		0·5-1·5	0·7-1·3	11·0-13·0	1·3	0·1	2·0-3·0	0·1	0·2	—	—	—	—		FHT	17·1 25·3	— —	— —	Sand Chill			
IS : 617	A-13 (Special)	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	2·0-3·0	0·1	—	0·2	0·1	0·1	—		WP	14·2 20·5	— —	65 65	Sand Chill		For pistons requiring special heat-treatment	
A.S. No. H.49	H49-11	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	2·0-3·0	0·1	—	0·2	0·1	0·1	—		T7	14·2 20·5	— —	65 65	Sand Chill			
B.S. 1490	LM13 (Special)	0·5-1·3	0·8-1·5	11·0-13·0	0·8	0·5	0·7-2·5	0·1	0·2	—	0·1	0·1	—		WP	14·2 20·5	— —	65 65	Sand Chill			
NF A57-702	AS12-UN-Y	0·5-1·5	0·80-1·50	11·5-13	0·75	0·3	0·5-1·5	0·20	0·10	—	0·10	0·05	—		Y35	19	—	85	Chill			

TABLE 12 COMPARISON OF IS DESIGNATION A-14 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1·1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-14	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—	REMAINDER	WP	22·0 28·3	— —	100 100	Sand Chill	One of 'Y' alloy series suitable for excellent strength and hardness at elevated temperature	Aircraft, diesel & heavy duty engine pistons; air-cooled cylinder heads; aircraft generator housings; aircraft structural castings, high duty gear boxes, etc	Mainly used as sand castings and gravity die castings
ASTM B 26	CN42A	3·5-4·5	1·2-1·8	0·7	1·0	0·35	1·7-2·3	0·35	0·25	—	—	—	(Cr=0·25)		T61	22·5	—	—	Sand			
ASTM B 108	CN42A	3·5-4·5	1·2-1·8	0·7	1·0	0·35	1·7-2·3	0·35	0·25	—	—	—	(Cr=0·25)		T61	28·1	—	—	Chill			
A.S. No. H.49	H49-12	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		T6	22·0 28·3	— —	100 100	Sand Chill			
B.S.1490	LM14	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		WP	22·0 28·3	— —	100 100	Sand Chill			
B.S.3L35	—	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·25	—	0·05	0·05	(Si+Fe =1·0)		Eq	22·0 28·3	— —	— —	Sand Chill			
CSA HA. 9	CN42	3·5-4·5	1·2-1·7	0·60	0·80	0·10	1·7-2·3	0·10	0·20	—	—	—	—		T6	22·5	—	—	Sand			
CSA HA. 10	CN42	3·5-4·5	1·2-1·7	0·60	0·80	0·10	1·7-2·3	0·10	0·20	—	—	—	—		T6	28·1	—	—	Chill			
CSN 42 4315	Al-Cu-Ni-Mg	3·75-4·50	1·25-1·75	0·5	0·7	—	1·75-2·25	0·1	0·2	—	—	—	—		Eq	18	0·3	80	Sand			
		3·75-4·50	1·25-1·75	0·5	0·7	—	1·75-2·25	0·1	0·15	—	—	—	—			20	0·3	80	Chill			
UNI 3045	G-AlCu4 NiMg	3·8-4·2	1·3-1·7	0·6	0·6	0·1	1·8-2·3	0·1	0·2	—	—	—	—		GsTA GcTA	21 25	0·5 0·3	90 95	Sand Chill			
ISO/R 164	Al-Cu4 Ni2Mg2	3·5-4·5	1·2-1·8	0·7	0·7	0·6	1·7-2·3	0·1	0·2	—	0·05	0·05	(Cr=0·2)		Eq	—	—	—	—			
JIS H 5202	AC5A	3·5-4·5	1·2-1·8	0·6	0·8	0·3	1·7-2·3	0·1	0·2	—	—	—	—		T6	30	—	110	Sand			
JUS C.C2.300	AlCu4 Mg1Ni2	3·8-4·2	1·3-1·7	0·6	0·3	0·1	1·8-2·3	0·1	—	—	—	—	—		Eq	20 28	1 0·5	90 105	Sand Chill			
S.A.B.S. 369	—	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		FHT	21·8 28·1	— —	— —	Sand Chill			
		3·5-4·5	1·3-1·8	0·7	0·8	0·3	1·7-2·3	0·3	0·2	—	—	—	(Cr=0·2)		FHT	21·8 28·1	— —	— —	Sand Chill			
IS : 617	A-14 (Special)	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		WP	18·9 23·6	— —	75 75	Sand Chill		For pistons requiring special heat-treatment	
A.S. No. H.49	H49-12	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		T7	18·9 23·6	— —	75 75	Sand Chill			
B.S. 1490	LM-14 (Special)	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		WP	18·9 23·6	— —	75 75	Sand Chill			
GOST 2685	АЛ1	3·75-4·50	1·25-1·75	0·7	0·8	—	1·75-2·25	0·3	—	—	—	—	—		T7	18	1	80	Sand and chill			
S.A.B.S. 370	—	3·5-4·5	1·2-1·7	0·6	0·6	0·6	1·8-2·3	0·1	0·2	—	0·05	0·05	—		FHT	22·9 23·5	— —	75 75	Sand Chill			
		3·5-4·5	1·3-1·8	0·7	0·8	0·3	1·7-2·3	0·3	0·2	—	—	—	(Cr=0·2)		FHT	22·9 23·5	— —	75 75	Sand Chill			

TABLE 13 COMPARISON OF IS DESIGNATION A-16 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-16	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	—	—	0·05	0·05	—	REMAINDER	W	17·3 20·5	2 3	— —	Sand Chill	Excellent fluidity; pressure tightness with resistance to corrosion; usable at elevated temperatures; weldable	Aircraft super charger covers; fuel pump bodies; air-compressor pistons; liquid-cooled cylinder heads; valve bodies; liquid-cooled aircraft engine crankcases; accessory housings; aircraft fittings, water jackets; cylinder block, blower housings, fire-hose couplings, etc	Mainly used as sand castings and gravity die castings
A.S. No. H.49	H49-13	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	—	—	0·05	0·05	—		T4	17·3 20·5	2 3	— —	Sand Chill			
B.S. 1490	LM16	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	0·2	—	0·1	0·05	—		W	17·3 23·6	2 3	— —	Sand Chill			
ISO/R 164	Al-Si5Cu1	1·0-1·5	0·3-0·6	4·5-6·0	0·8	0·5	0·3	0·5	0·2	—	0·2	0·1	—		Eq	—	—	—	—			
CSN 42 4380	Al-Si5-Cu	1·0-1·5	0·35-0·6	4·5-5·5	·6	0·5	—	0·3	—	—	—	0·1	(Ti+Cr =0·2)		Eq	20	—	70	Sand			
IS : 617	A-16	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	—	—	0·05	0·05	—		WP	23·6 26·8	— —	— —	Sand Chill			
ASTM B 26	SC51A	1·0-1·5	0·40-0·6	4·5-5·5	0·8	0·50	—	0·35	0·25	—	—	—	(Cr=0·25)		T6	22·5	2·0	—	Sand			
ASTM B 108	SC51A	1·0-1·5	0·40-0·6	4·5-5·5	0·8	0·50	—	0·35	0·25	—	—	—	(Cr=0·25)		T6	26·0	1·5	—	Chill			
QQ-A-601c	355	1·0-1·5	0·40-0·6	4·5-5·5	0·6	0·50	—	0·35	0·25	—	—	—	(Cr = 0·25)		T6	22·5	2·0	—	Sand			
A.S. No. H.49	H49-13	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	—	—	0·05	0·05	—		T6	23·6 26·8	— —	— —	Sand Chill			
M 3429	GAlSi5Cu1	1·0-1·6	0·3-0·6	4·5-6·0	0·7	0·3-0·5	—	0·5	0·15	—	0·2	0·1	(Fe+Mn =1·1)		Eq	21 23	0·5 0·5	80 85	Sand Chill			
B.S. 1490	IM16	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·1	0·2	—	0·1	0·05	—		WP	23·6 28·3	— —	— —	Sand Chill			
B.S. 2L78	—	1·0-1·5	0·4-0·6	4·5-5·5	0·6	0·5	0·25	0·10	0·25	—	0·05	0·05	—		Eq	25·2 29·9	— —	— —	Sand Chill			
CSA HA. 9	SC51	1·0-1·5	0·40-0·60	4·5-5·5	0·60	0·30	—	0·10	0·20	—	—	—	—		T6	22·5	2	—	Sand			
CSA HA. 10	SC51	1·0-1·5	0·40-0·60	4·5-5·5	0·60	0·30	—	0·10	0·20	—	—	—	—		T6	26·0	1·5	—	Chill			
DIN 1725	G-AlSi5 Cu1	1·0-1·5	0·3-0·6	5·0-6·0	0·7	0·5	0·3	0·50	0·15	—	0·2	0·1	(Fe+Mn =1·1)		wa	21 23	0·5 0·5	80 85	Sand Chill			
UNI 3600	G-AlSi5 CuMg	1·1-1·5	0·40-0·60	4·5-5·5	0·7	0·2	0·2	0·10	0·15	—	—	—	(Cr=0·15)		GsTA GcTA	22 31	2 5	85 100	Sand Chill			
PN-53 H-88027	AlSi5Cu1	1·0-1·5	0·35-0·6	4·5-5·5	0·7	0·5	—	0·3	—	—	—	—	—		Eq	16	—	65	Sand			
		1·0-1·5	0·35-0·6	4·5-5·5	1·0	0·5	—	0·3	—	—	—	—	—			20	—	70	Chill			
GOST 2685	AЛ5	1·0-1·5	0·35-0·6	4·5-5·5	0·6	0·5	—	0·3	0·15	—	—	0·01	(Be=0·1)		T6	23	0·5	70	Sand			

TABLE 14 COMPARISON OF IS DESIGNATION A-18 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm²	Elongation, Percent	Brinell Hardness				
IS : 617	A-18	0·1	0·10	4·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—	REMAINDER	M	11·8 14·2	3 4	— —	Sand Chill	General purpose alloy with excellent fluidity and pressure tightness; resistant to corrosion and good ductility but low strength properties; weldable	Used for marine fittings, manifold water jackets, meter cases, utensils; steam iron, electric floor polishers, vacuum cleaners, etc	Mainly used as sand castings and gravity die castings
ASTM B 26	S5A	0·15	0·05	4·5-6·0	0·8	0·35	—	0·35	0·25	—	—	—	—		F	12·0	3·0	—	Sand			
ASTM B 26	S5B	0·6	0·05	4·5-6·0	0·8	0·50	—	0·50	0·25	—	—	—	(Cr=0·25)		F	12·0	3·0	—	Sand			
ASTM B 85	S5C	0·6	0·10	4·5-6·0	2·0	0·35	0·50	0·50	—	—	—	0·15	—		F	23·2	9·0	—	Die			
QQ-A-596c	43	0·15	0·05	4·5-6·0	0·8	0·35	—	0·35	0·25	—	—	—	—		F	14·8	5·0	—	Semi-chill			
QQ-A-601c	43	0·15	0·05	4·5-6·0	0·8	0·35	—	0·35	0·25	—	—	—	—		F	12·0	3·0	—	Sand			
A.S. No. H.49	H49-14	0·1	0·1	4·5-6·0	0·6	0·5	0·1	0·1	—	0·2	0·1	0·05	—		F	11·8 14·2	3 4	- —	Sand Chill			
B.S. 1490	LM18	0·1	0·10	4·5-6·0	0·6	0·5	0·1	0·1	0·2	—	0·1	0·05	—		M	11·8 14·2	3 4	— —	Sand Chill			
CSA HA. 9	S5	0·10	—	4·5-6·0	0·80	0·10	—	0·10	0·20	—	—	—	—		F	12·0	3	—	Sand			
CSA HA. 10	S5	0·10	—	4·5-6·0	0·80	0·10	—	0·10	0·20	—	—	—	—		F	14·8	5	—	Chill			
ISO/R 164	AlSi5	0·10	0·1	4·0-6·0	0·8	0·5	0·1	0·1	0·20	—	0·1	0·1	—		Eq	—	—	—	—			
	AlSi5Fe	0·10	0·1	4·0-6·0	1·3	0·5	0·1	0·1	0·20	—	0·1	0·1	—		Eq	—	—	—	—			
JIS H 5302	ADC7	0·6	0·3	4·5-6·0	2·0	0·3	0·5	0·5	—	—	—	0·1	—		Untreated	21·0	5·0	—	Die			
KSD 6006	AlDC5	0·6	0·3	4·5-6·0	2·0	0·3	0·5	0·5	—	—	—	0·1	—		Eq	21·0	5·0	—	Die			
UNE 38 259	Al-Si5	0·10	0·1	4-6	0·8	0·5	0·1	0·1	0·20	—	0·1	0·1	—		Eq	12 14	3 4	40 50	Sand Chill			
S.A.B.S. 375	—	0·1	0·10	4·5-6·0	0·6	0·5	0·1	0·1	—	—	0·1	0·05	—		AC	12·0 14·0	3 4	— —	Sand Chill			
		0·3	0·05	4·5-6·0	0·6	0·3	—	0·3	0·2	—	—	—	(Cr=0·2)		AC	12·0 14·0	3 4	— —	Sand Chill			

TABLE 15 COMPARISON OF IS DESIGNATION A-22 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm^2	Elongation, Percent	Brinell Hardness				
IS : 617	A-22	2·8-3·8	0·05	4·0-6·0	0·7	0·3-0·6	0·15	0·15	—	0·2	0·05	0·05	—	REMAINDER	W	25·2	8	—	Chill	Has good shock-resistance and strength	For heavy duty service in road transport vehicles, namely, cross bearers and other structural components	Used as gravity die castings
M 3429	GD Al SiCu	2·0-3·0	0·5	5·0-6·5	1·2	0·2-0·6	0·5	0·7	—	—	0·3	0·3	—		—	19	1	55	Die			
B.S. 1490	LM22	2·8-3·8	0·05	4·0-6·0	0·7	0·3-0·6	0·15	0·15	0·2	—	0·1	0·05	—		W	25·2	8	—	Chill			
CSN 42 4382	Al-Si5-Cu3	2·0-3·0	0·5	5·0-6·5	0·9	0·2-0·6	0·5	0·7	—	—	0·2	0·1	—		Eq	16	0·5	55	Die			

TABLE 16 COMPARISON OF IS DESIGNATION A-24 ALUMINIUM ALLOY CASTINGS WITH OVERSEAS STANDARDS

(*Clause* 1.1)

Specification No.	Designation	Chemical Composition, Percent (Figures Quoted Represent Maximum Values Unless Otherwise Stated)													Mechanical Properties (Figures Quoted Represent Minimum Values Unless Otherwise Stated)				Test Piece	Characteristics	Typical Applications	Type of Casting Suitability
		Cu	Mg	Si	Fe	Mn	Ni	Zn	Ti	Ti+ Nb	Pb	Sn	Also Specified	Al	Condition	Tensile Strength, kgf/mm^2	Elongation, Percent	Brinell Hardness				
IS : 617	A-24	3·0-4·0	0·1	7·5-9·5	1·3	0·5	0·5	1·0	—	—	0·3	0·2	—	REMAINDER	M	18·1	1·5	—	Chill	General purpose die-casting alloy of medium strength with poor corrosion resistance	Suitable for general purpose die-casting applications	Used as pressure die castings
ASTM B 85	SC84A	3·0-4·0	0·10	7·5-9·5	1·3	0·50	0·50	3·0	—	—	—	0·35	—		F	33·0	3·5	—	Die			
ASTM B 85	SC84B	3·0-4·0	0·10	7·5-9·5	2·0	0·50	0·50	3·0	—	—	—	0·35	—		F	32·3	2·5	—	Die			
QQ-A-591d	A380	3·0-4·0	0·10	7·5-9·5	1·3	0·50	0·50	3·0	—	—	—	0·35	—		F	33·0	3·5	—	Die			
QQ-A-591d	380	3·0-4·0	0·10	7·5-9·5	2·0	0·50	0·50	3·0	—	—	—	0·35	—		F	32·3	2·5	—	Die			
A.S. No. H.49	H49-16	3·0-4·0	0·1	7·5-9·5	1·3	0·5	0·5	1·0	—	—	0·3	0·2	—		F	18·1	1·5	—	Chill			
NBN 436	GAlSi9 Cu3	2-4	0·15	7·0-10·0	1·5	0·2-0·6	0·3	0·5	0·25	—	0·05	0·05	(Cr=0·2)		Eq	20	0·5	80	Die			
B.S. 1490	LM24	3·0-4·0	0·1	7·5-9·5	1·3	0·5	0·5	3·0	0·2	—	0·3	0·2	—		M	18·1	1·5	—	Chill			
DS 15512	Al512	3·0-4·0	0·15	8·0-10·0	1·0	0·5	—	1·0	—	—	—	—	—		Eq	14	3	55	Die			
UNI 5075	GD-AlSi 8·5Cu3·5Fe	3·0-4·0	0·3	8·0-9·5	1·1	0·4	0·30	0·7	0·15	—	0·15	0·10	—		Gp	22	1	85	Die			
ISO/R 164	Al-Si8 Cu3Fe	2·5-4·5	0·15	7·0-9·5	1·3	0·6	0·3	1·2	0·2	—	0·3	0·2	—		Eq	—	—	—	—			
JIS H 5302	ADC10	2·0-4·5	0·3	7·5-9·5	1·3	0·5	0·5	1·0	—	—	—	0·3	—		F	28·8	3·0	—	Die			
KSD 6006	AlDC7	2·0-4·5	0·3	7·5-9·5	1·3	0·5	0·5	1·0	—	—	—	0·3	—		Eq	28·8	3·0	—	Die			
SIS 14 4252	AlSi8Cu3	2·5-4·5	0·3	7·0-9·5	1·3	0·6	0·5	1·2	0·2	—	0·3	0·2	—		M	25	1	70	Die			
JUS C.C2.300	AlSi8Cu3	3·0-4·0	0·1	7·5-9·5	1·0	0·5	—	0·9	—	—	—	—	—		Eq	18 18	1 1	70 80	Chill Die			

APPENDIX A

(*Clause* 0.2)

LIST OF OVERSEAS STANDARDS COVERED IN THE COMPARISON

International Organization for Standardization (ISO)

ISO/R 164-1960	Composition of aluminium alloy castings

American

ASTM B 26-1965	Aluminium-alloy sand castings
ASTM B 85-1960	Aluminium-alloy die castings
ASTM B 108-1965	Aluminium-alloy permanent mould castings
QQ-A-591d-1963	Federal specification. Aluminium-alloy die castings
QQ-A-596c-1962	Federal specification. Aluminium-alloy permanent and semi-permanent mould castings
QQ-A-601c-1961	Federal specification. Aluminium-alloy sand castings

Australian

A.S. No. H. 49-1962	Aluminium alloy ingots and castings for general engineering purposes

Austrian

M 3429-1954	Light metal cast alloys

Belgian

NBN 436-1958	General purpose aluminium alloys for castings

British

B.S. 1490 : 1963	Aluminium and aluminium alloy ingots and castings for general engineering purposes
B.S. 4L33 : 1959	Aircraft material — Aluminium-silicon alloy ingots and castings
B.S. 3L35 : 1959	Aircraft material — 'Y' aluminium alloy ingots and castings (heat treated) (suitable for pistons)
B.S. 2L53 : 1959	Aircraft material — Aluminium-magnesium alloy ingots and castings (solution treated)
B.S. L74 : 1959	Aircraft material — Aluminium-magnesium alloy ingots and castings
B.S. L75 : 1959	Aircraft material — Aluminium-silicon-magnesium alloy ingots and castings (solution treated and precipitation treated)
B.S. 2L78 : 1967	Aircraft material — Aluminium-silicon-copper alloy ingots and castings (solution treated and precipitation treated)
B.S. L79 : 1959	Aircraft material — Aluminium-silicon-copper alloy ingots and castings
D.T.D. 298B-1960	Aircraft material specification — aluminium — 4·5 percent copper alloy ingots and castings (heat treated)
D.T.D. 716A-1960	Aircraft material specification — aluminium-silicon-magnesium alloy ingots and castings (as cast)
D.T.D. 727A-1960	Aircraft material specification — aluminium-silicon magnesium alloy ingots and castings (solution treated)
D.T.D. 735A-1960	Aircraft material specification — aluminium-silicon-magnesium alloy ingots and castings (solution treated and precipitation treated)

Canadian

CSA HA.9-1958	Aluminium alloy sand castings
CSA HA.10-1958	Aluminium alloy permanent mould and semi-permanent mould castings

Czechoslovakian

CSN 42 4315-1958	Aluminium-copper-nickel-magnesium alloy casting
CSN 42 4330-1958	Aluminium-silicon alloy casting (Si13)
CSN 42 4336-1958	Aluminium-silicon-copper-nickel alloy casting
CSN 42 4356-1958	Aluminium-copper alloy casting (Cu8)
CSN 42 4380-1958	Aluminium-silicon-copper alloy casting (Si5)
CSN 42 4381-1958	Aluminium-silicon-copper alloy casting (Si5, Cu2)
CSN 42 4382-1958	Aluminium-silicon-copper alloy casting (Si5, Cu3)
CSN 42 4515-1958	Aluminium-magnesium alloy casting (Mg5)
CSN 42 4518-1958	Aluminium-magnesium alloy casting (Mg11)

Danish

DS 15501-1955	Aluminium alloy with 13 percent silicon for casting
DS 15511-1955	Aluminium alloy with 5 percent silicon and 3 percent copper for casting
DS 15512-1955	Aluminium alloy with 9 percent silicon and 3·5 percent copper for die castings

French

NF A57-702-1960	Aluminium and aluminium alloy castings by gravity
PN A57-703-1962	Aluminium and aluminium alloys pressure die castings

German

DIN 1725-1959 Sheet 2	Aluminium alloys, cast alloys-sand castings, chilled castings, pressure castings

German Democratic Republic

TGL 6556-1965 Sheet 2	Aluminium casting alloys — chemical composition and properties of castings

Italian

UNI 3041-1950	Aluminium-copper-iron-magnesium alloy castings (Cu 10%, Fe 1%, Mg 0·3%)
UNI 3044-1950	Aluminium-copper alloy castings (Cu 4·5%)
UNI 3045-1950	Aluminium-copper-nickel-magnesium alloy castings (Cu 4%, Ni 2%, Mg 1·5%)
UNI 3049-1950	Aluminium-silicon-magnesium alloy castings (Si 12%, Mn 0·5%, Mg 0·3%)
UNI 3054-1950	Aluminium-silicon-manganese-magnesium alloy castings (Si 4·5%, Mn 0·7%, Mg 0·65%)
UNI 3058-1950	Aluminium-magnesium alloy castings (Mg 5%)
UNI 3600-1955	Aluminium-silicon-copper-magnesium alloy castings (Si 5%, Cu 1·3%, Mg 0·5%)
UNI 4514-1960	Aluminium-silicon alloy castings (Si 13%)
UNI 5075-1962	Aluminium-silicon-copper-iron alloy castings (Si 8·5%, Cu 3·5%, Fe 0·7%)

Japanese

JIS H 5202-1964	Aluminium alloy castings
JIS H 5302-1958	Aluminium alloy die castings

Korean

KS D 6006-1963	Aluminium alloy die castings

Netherlands

NEN 6026-1967	Aluminium alloy castings — classification and mechanical properties

Polish

PN-53 H-88027-1956	Aluminium casting alloys

Russian

GOST 2685-1963	Aluminium casting alloys

South African

S.A.B.S. 369-1952	Specification for 4 copper, 2 nickel, 1½ magnesium aluminium alloy castings in the fully heat-treated condition
S.A.B.S. 370-1952	Specification for 4 copper, 2 nickel, 1½ magnesium alumininm alloy castings in the fully heat-treated and stabilized condition
S.A.B.S. 371-1952	Specification for 10 percent magnesium aluminium alloy castings in the solution-heat-treated condition
S.A.B.S. 372-1952	Specification for 11½ percent silicon aluminium alloy castings in the 'as cast' condition
S.A.B.S. 374-1952	Specification for 9¾ copper, 1 iron, ¼ magnesium aluminium alloy castings in the fully heat-treated condition
S.A.B.S. 375-1952	Specification for 5¼ percent silicon aluminium alloy castings in the 'as cast' condition
S.A.B.S. 376-1952	Specification for 5¼ silicon, ½ manganese, ½ magnesium aluminium alloy castings in the solution-heat-treated condition
S.A.B.S. 377-1952	Specification for 5¼ silicon, ½ manganese, ½ magnesium aluminium alloy castings in the fully heat-treated condition
S.A.B.S. 380-1952	Specification for 12 silicon, 2½ nickel, 1 copper, 1 magnesium aluminium alloy castings in the fully heat-treated condition

Spanish

UNE 38 252	Light aluminium alloy for casting (Al-Si-12)
UNE 38 254	Light aluminium alloy for casting (Al-Si-Mg-12)
UNE 38 259	Light aluminium alloy for casting (Al-Si-5)

Swedish

SIS 14 4231-1964	Aluminium alloy 4231
SIS 14 4252-1964	Aluminium alloy 4252
SIS 14 4260-1964	Aluminium alloy 4260
SIS 14 4261-1964	Aluminium alloy 4261

Swiss

VSM 10854-1951	Aluminium-magnesium alloy for castings
VSM 10855-1951	Aluminium-silicon alloy for castings

Yugoslavian

JUS C.C2.300-1959	Aluminium alloy castings

APPENDIX B

(*Clause* 0.2)

TEMPER DESIGNATIONS AS USED IN THE COMPARISON

Indian and British Specifications

M	As cast condition material
W	Solution treated material
P	Precipitation treated material
WP	Solution- and precipitation-treated material, that is, fully heat-treated, and
WP (Special)	Stabilized

ASTM, Federal, Australian, Canadian, Japanese and Russian Specifications

F	As cast
T4	Solution-heat-treated
T5	Artificially aged only
T6, T61 and T65	Solution-heat-treated and then artificially aged
T7	Solution-heat-treated and then stabilized

French Specifications

Sand Casting

Y20	Untreated
Y23	Solution treated and artificially aged
Y24	Solution treated and naturally aged

Chill Casting

Y30	Untreated
Y33	Solution treated and artificially aged
Y34	Solution treated and naturally aged
Y35	Stabilized

German Specifications

—	Untreated
ho	Homogenized
ka	Age-hardened
wa	Quenched and age-hardened
ta	Partially age-hardened

Italian Specifications

Sand Casting

Gs	Untreated
GsTN	Solution treated and naturally aged
GsTA	Solution treated and artificially aged

Chill Casting

Gc	Untreated
GcTA	Solution treated and artificially aged

Die Casting

Gp	Untreated

South African Specifications

AC	As cast
SHT	Solution-heat-treated
FHT	Fully heat-treated

NOTE — Abbreviation 'Eq' has been used under the column 'Condition' in the comparison for the rest of the overseas standards as from the details of heat-treatment given in these standards, the condition has been interpreted as approximately equivalent to the relevant condition specified in the Indian Standard.